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PRE-APPEAL BRIEF REQUEST FOR REVIEW		Docket Number (Optional)
		SCS-540-567
Application Number	Filed	
10/537,898	June 7, 2005	
First Named Inventor		
GRIFFITH		
Art Unit	Examiner	
2873	J. Jones	
<p>Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.</p> <p>This request is being filed with a notice of appeal.</p> <p>The review is requested for the reason(s) stated on the attached sheet(s). Note: No more than five (5) pages may be provided.</p> <p>I am the</p> <p><input type="checkbox"/> Applicant/Inventor</p> <p><input type="checkbox"/> Assignee of record of the entire interest. See 37 C.F.R. § 3.71. Statement under 37 C.F.R. § 3.73(b) is enclosed. (Form PTO/SB/96)</p> <p><input checked="" type="checkbox"/> Attorney or agent of record <u>27,393</u> (Reg. No.)</p> <p><input type="checkbox"/> Attorney or agent acting under 37CFR 1.34. Registration number if acting under 37 C.F.R. § 1.34 _____</p> <p>NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.*</p> <p><input checked="" type="checkbox"/> *Total of 1 form/s are submitted.</p>		

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**STATEMENT OF ARGUMENTS IN SUPPORT OF
PRE-APPEAL BRIEF REQUEST FOR REVIEW**

The following listing of clear errors in the Examiner's rejection and his failure to identify essential elements necessary for a *prima facie* basis of rejection is responsive to the Final Official Action mailed June 26, 2007 (Paper No. 20070610).

**Error #1. The Examiner fails to point out where the
Shen reference discloses all three elements recited in
Applicants' independent claim 1**

Applicants' independent claim 1 positively recites a deformable mirror comprised of "a passive substrate layer," "a first layer of actively deformable material" and "a linear actuator." On page 2 of the outstanding Final Rejection, the Examiner correctly notes that the Shen reference teaches mirror 18 and that this presumably corresponds to Applicants' claimed "passive substrate layer." The Examiner appear to ignore the language of claim 1 with respect to his allegation that the "first layer of actively deformable material" is shown in "fig. 2, col. 4, ln. 1-21 '20" as the 'first layer'." The Examiner then alleges that the "linear actuator" is also taught by item "20" as well.

Applicants note that the claimed "first layer" and the claimed "linear actuator" have mutually exclusive characteristics as clearly recited in independent claim 1. The first layer is a material which deforms the mirror "as a result of transverse expansion or contraction" (emphasis added) whereas the second structure, i.e., the linear actuator, is exactly that – a linear actuator – something which changes its linear dimension so as to further deform the mirror. The Examiner identifies item "20" as being both the claimed "first layer" and the "linear actuator." Because these are mutually exclusive, there can be no disclosure in the Shen reference that "actuators 20" can comprise both the claimed "first layer" and the claimed "linear actuator."

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Accordingly, the Examiner has failed to indicate how or where Shen teaches both claimed features of independent claim 1. The Shen reference teaching of actuator 20 can be only one of the two claimed elements and therefore the rejection under §102 clearly fails.

Error #2. The Examiner fails to point out where the Shen reference discloses a “first layer of actively deformable material . . . for deforming the mirror as a result of transverse expansion or contraction”

Applicants' independent claim 1 positively recites that the “first layer of actively deformable material” has a thickness and is attached to the passive substrate layer, i.e., the mirror. However, claim 1 also recites that this first layer deforms the mirror “as a result of transverse expansion or contraction of the deformable material under the influence of a field applied across said thickness.”

The Examiner appears to have completely ignored the requirement that the mirror deformation occurs as a result of “transverse expansion or contraction.” The common dictionary definition of “transverse” is “acting, lying, or being across” the layer. Thus, it is expansion or contraction of the piezoelectric layer 18 in the sideways direction, i.e., in the plane of the copper substrate 14, that causes the substrate to deform.

There is no disclosure that the alleged deformable material “layer” 20 in Shen expands or contracts because if it did, it would have little or no effect on the mirror because there is no fixed support on the other side of the piezoelectric element 18 to push against, except for the linear actuator 24.

Thus, the Shen reference, in disclosing only actuators 20 which are “linear actuators” and which provide a change of dimension only in their longitudinal direction, only discloses movement in the thickness direction and teaches away from movement in the claimed

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"transverse" direction. Also, if the intermediate structure 14 is removed, linear actuators 20 will have no effect on the mirror.

Additionally, Applicants' independent claim specifies that the transverse expansion or contraction of the deformable material is a result of "the influence of a field applied across said thickness." It is clear that, in order to obtain the linear actuator deformation of actuators 20 in the Shen reference, the field is applied across the linear actuator, i.e., in a direction which is orthogonal to the thickness direction specified in the claim. The Examiner appears to ignore this claim limitation as well.

As a result of the above, even if Shen were believed to disclose the three recited elements of Applicants' independent claim 1, it clearly fails to teach a first layer of deformable material which deforms the mirror as a result of "transverse expansion or contraction" or material that does so "under the influence of a field applied across said thickness." The absence of either one of these limitations in the Shen reference clearly avoids any further rejection under 35 USC §102.

Error #3. The Examiner fails to make any *prima facie* case of obviousness of independent claim 1 or claims dependent thereon

In the rejection of claims 10-13 under §103, the Examiner combines Shen with Bacich. As noted above, Shen does not teach the three recited elements or the first layer of deformable material which has "transverse expansion or contraction" or which operates under the influence of "a field applied across said thickness." The Examiner makes no allegation in the Final Rejection that the Bacich reference supplies any one of the three missing aspects of Applicants' independent claim 1 or claims dependent thereon. Thus, even if the Shen and Bacich references were combined, they would not establish a *prima facie* case of obviousness.

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Additionally, the U.S. Supreme Court has recently confirmed in the *KSR* decision that it is incumbent upon the Examiner to articulate some "reason" for combining references. The Examiner has simply failed to disclose any reason for combining Shen and Bacich, other than his conclusory statement as to obviousness. As a result, the Examiner has clearly failed to establish any *prima facie* basis of obviousness and any further rejection of claim 1 or claims 10-13 dependent thereon is respectfully traversed.

Error #4. The Examiner fails to appreciate that the Shen reference would clearly lead one of ordinary skill in the art away from the Shen reference by itself or in combination with Bacich

Even if the Examiner believes that linear actuators 20 can comprise the claimed "first layer of actively deformable material" with the claimed "transverse expansion or contraction" Shen teaches away from such a material. Clearly the transverse (or sideways) expansion or contraction of actuators 20 will not result in any deformation of mirror 18. Instead, as shown in arrow 11, actuation of the linear actuators 20 will cause various portions of the mirror to be pushed out or pulled in, thereby accomplishing the desired deformation. However, this push/pull deformation is not "transverse expansion or contraction" of the deformable material.

Therefore, because Shen teaches a different manner of achieving mirror deformation, it would lead one of ordinary skill in the art away from Applicants' claimed invention which teaching defeats any *prima facie* case of obviousness.

SUMMARY

In the rejection of independent claim 1 and claims dependent thereon, the Examiner has failed to establish how or why the Shen reference discloses all claimed elements. The reference to Shen's high bandwidth actuators 20 can comprise only one of the two mutually exclusive

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recited elements, i.e., the "first layer" or the "linear actuator." It cannot disclose both and therefore fails to disclose all claimed elements.

Moreover, the limitations recited in the "first layer" are not only not present in Shen, but are specifically taught away from by the Shen reference. Shen teaches liner actuators which push/pull portions of the mirror toward or away from its nominal position. Applicants' claim requires a layer which provides "transverse expansion or contraction" which will result in increasing or decreasing the curvature of the mirror. Shen's linear actuators teach away from this.

Additionally, the transverse expansion or contraction of the deformable material in claim 1 is accomplished under "the influence of a field applied across said thickness." In order to obtain operation of the actuators 20, the field must be applied across the diameter of the actuators, i.e., in a direction parallel to the surface of the mirror, rather than across the thickness of the "layer" which is attached to the mirror which would have a field applied in a direction perpendicular to the mirror.

As a result of the above, there is simply no support for the rejection of Applicants' independent claim 1 or claims dependent thereon under 35 USC §102 or §103. Applicants respectfully request that the Pre-Appeal Panel find that the application is allowed on the existing claims and prosecution on the merits should be closed.